

CLAIMS

1. (Amended)

A semiconductor memory element characterized by comprising a γ -Al₂O₃ single crystal film epitaxially grown on a semiconductor single crystal substrate having an FET structure, an epitaxial single crystal Pt thin film disposed on the γ -Al₂O₃ single crystal film, a highly oriented ferroelectric thin film disposed on the epitaxial single crystal Pt thin film, and an upper electrode disposed on the ferroelectric thin film and having a memory feature.

2. (Canceled)

3. (Amended)

The semiconductor memory element according to Claim 1, characterized in that a Si single crystal substrate is used as the semiconductor single crystal substrate.

4. (Amended)

The semiconductor memory element according to Claim 3, characterized in that the surface of the Si single crystal substrate is a (100) face.

5. (Amended)

The semiconductor memory element according to any one of Claims 1, 3, and 4, characterized in that a thin film made of any one of BaMgF₄, Bi₄Ti₃O₁₂, (Bi,La)₄Ti₃O₁₂, BaTiO₃, Ba_xSr_{1-x}TiO₃, SrBi₂Ta₂O₉, PbTiO₃, Pb_yLa_{1-y}Zr_xTi_{1-x}O₃, and ZnO is used as the ferroelectric thin film.

6. (Amended)

An ultrasonic sensor characterized by comprising a γ - Al_2O_3 single crystal film epitaxially grown on a semiconductor single crystal substrate, an epitaxial single crystal Pt thin film disposed on the γ - Al_2O_3 single crystal film, a highly oriented ferroelectric thin film disposed on the epitaxial single crystal Pt thin film, and an upper electrode disposed on the ferroelectric thin film, wherein the semiconductor single crystal substrate is subjected to a treatment for adjusting a resonant frequency and an ultrasonic wave is detected.

7. (Amended)

The ultrasonic sensor according to Claim 6, characterized in that the semiconductor single crystal substrate has an SOI structure.

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)